

# Carotid Sheath MCQ

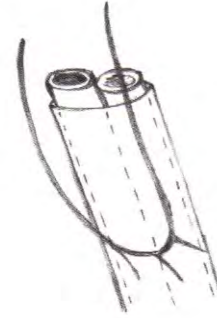
It is a tube of deep fascia extending from base of the skull down to root of the neck.

## IT SURROUNDS THE:

- 1) **Internal Jugular vein:** laterally.
- 2) **Common carotid & internal carotid a:** medially.  
N.B: ext carotid is not surrounded by the sheath
- 3) **Vagus nerve:** behind the interval between the internal jugular vein & common carotid artery.

## STRUCTURES EMBEDDED IN ITS WALLS:

- 1) **Sympathetic trunk:** embedded in posterior wall.
- 2) **Ansa Cervicalis & its roots:** embedded in the ant wall

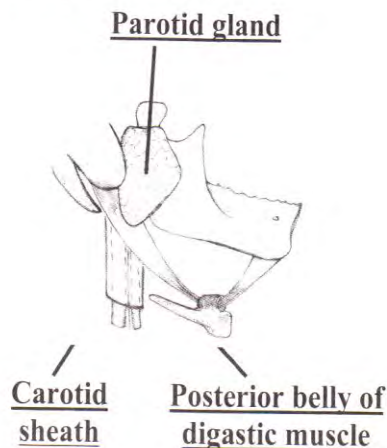
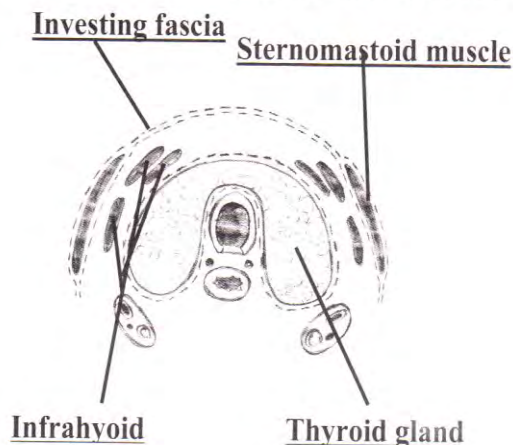


## SUPERFICIAL RELATIONS:

- **Below upper border of thyroid cartilage ;**
  - Thyroid gland.
  - Infrahyoid muscles (sternohyoid, sternothyroid, omohyoid).
  - Sternomastoid muscle.
- **Above the upper border of thyroid cartilage:**
  - Styloid process and attached structures.
  - Posterior belly of Digastric m.
  - Parotid gland.

## DEEP RELATIONS:

- MCQ = Transverse processes of all cervical vertebrae and the covering prevertebral muscles & fascia.
- Inferior thyroid artery: crosses deep to it at C6 (on both sides).
  - Thoracic duct: crosses deep to it at C7 (on left side).



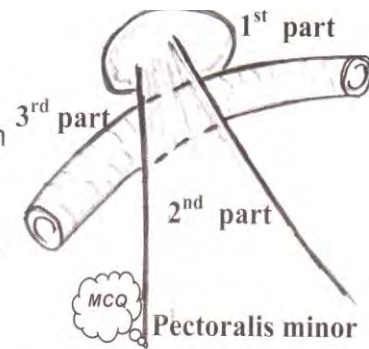
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# Axillary Artery

**Begins:** at the outer border of 1<sup>st</sup> rib as a continuation of subclavian artery.

**Ends:** at the lower border of the teres major muscle as brachial artery.



**Pectoralis minor muscle divides the axillary artery into 3 parts:**

## A-1<sup>st</sup> Part:

- Lies above the pectoralis minor muscle.
- **Relation** : (see diagram)
- **Branches**: superior thoracic artery.



## B-2<sup>nd</sup> Part:

- Lies behind pectoralis minor.
- **Relation**: (see diagram)
- **Branches**:
  - 1- Thoracoacromial artery (pierce clavipectoral fascia),
  - 2- Lateral thoracic artery (supplies ♀ breast).

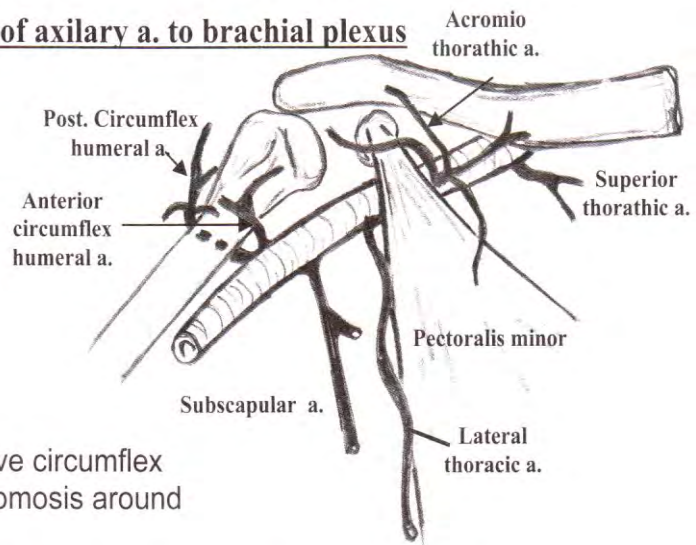
## C-3<sup>rd</sup> Part:

### Relations of axillary a. to brachial plexus

- Lies below pectoralis minor
- Lies medial to the short head of biceps & coracobrachialis.
- **Relation**: (see diagram)

### **Branches:**

- Subscapular: give circumflex scapular (anastomosis around scapula).
- Posterior circumflex humeral: around the surgical neck.
- Anterior circumflex humeral: around the surgical neck & gives branches to the shoulder joint.



## Surgical Importance:

### Exposure:

- The incision used to expose the subclavian artery in the neck can be extended across the clavicle into the deltopectoral groove.
- A subclavicular incision 1 cm below the clavicle (started at the junction of the medial 1/4 with the outer 3/4 of the clavicle & extended for 6 cm laterally).

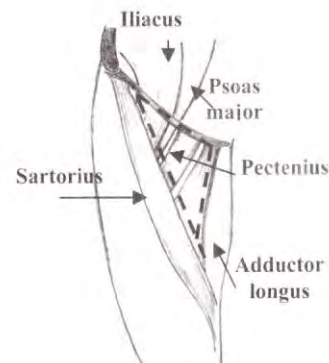


# Femoral Triangle (Scarpa's Triangle)

**MCQ** It is a **subfascial space** occupying the front of the **upper 1/3** of the thigh just below the inguinal ligament.

## BOUNDARIES:

- **Laterally:** Medial border of Sartorius.
- **Medially:** Medial border of adductor longus (so the muscle also shares in the floor)
- **Base:** Poupart's ligament (inguinal ligament).
- **Apex:** meeting of sartorius & adductor longus (beginning of Hunter's canal)

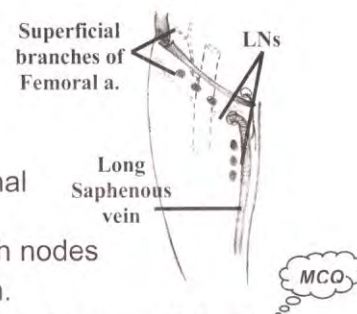


## FLOOR:

From medial to lateral: → adductor longus, pectineus, psoas major & iliatus muscle

## ROOF:

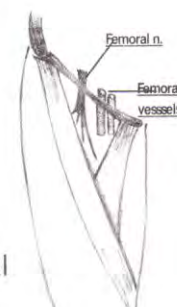
1. Skin.
2. **Superficial fascia** consisting of fatty layer & membranous layer just a fingerbreadth below inguinal ligament
3. In between there are:
  - superficial branches of femoral a.: (superficial epigastric, superficial external pudendal & superficial circumflex iliac)
  - The "T" shaped superficial inguinal lymph nodes
  - Great saphenous v. & the ilio-inguinal n.
4. **Deep fascia** containing the **saphenous opening** (which is a defect in the fascia covered by cribriform fascia)



## CONTENTS:

- 1) **Femoral artery:** & its branches; profunda femoris
- 2) & deep external pudendal
- 3) **Femoral vein:** & its tributaries
- 4) **Femoral sheath:** surrounding the upper 4 cm of femoral vessels
- 5) **Femoral nerve:** (outside the sheath), but femoral branch of genitofemoral n. is inside the sheath
- 6) **Deep inguinal LNs**

**N.B:** At the apex structures are arranged from anterior to posterior as: Femoral artery, femoral vein, profunda femoris vein & profunda femoris artery.



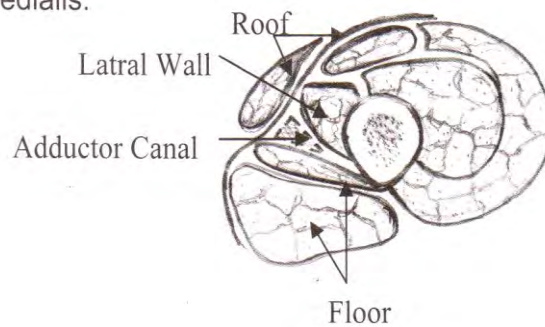
# Hunter's Canal (Adductor or Subsartorial Canal)

**SITE:** middle 1/3 of the thigh. It begins at the apex of femoral triangle & ends at the opening in adductor magnus m.

MCQ

## BOUNDARIES

- **Roof:** a strong fibrous membrane on which lies the sartorius m.
- **Floor:** adductor longus & magnus muscles
- **Lateral Wall:** vastus medialis.



## CONTENTS

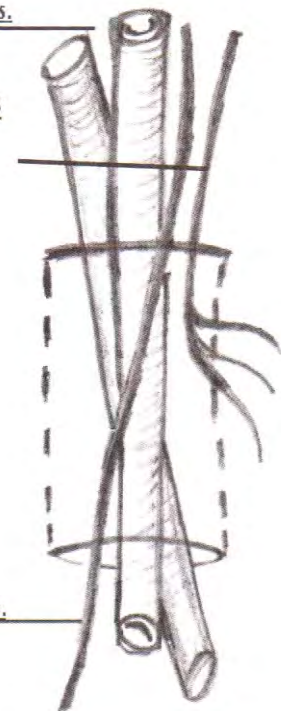
1. **Femoral vessels.** The vein at first is behind the artery then lateral to it
2. **Descending genicular a.** → From femoral a. (anastomtica magna )
3. **Nerve to Vastus- medialis** → Lateral to the vessels
4. **Saphenous nerve** → Crosses the vessels from lateral to medial side.

MCQ

Nerve to vastus medialis

Femoral vs.

Saphenous n.



## SURGICAL IMPORTANCE:

To ↓ the bleeding in above knee amputation, we ligate the femoral vessels in the canal by dividing the Sartorius & its fascia. However, if there is arteriosclerosis there is no need for ligation.



# The Femoral Artery

MCQ

## Begins:

As the continuation of external iliac artery behind the midinguinal point (Midway between ASIS & symphysis pubis)

MCQ

## Ends:

by becoming the popliteal artery by passing through an opening in the adductor magnus between its 2 insertions (10cm above knee joint)

## Surface Anatomy:

(with the thigh flexed, abducted & laterally rotated)

It corresponds to the upper  $\frac{2}{3}$  of a line drawn from the mid-inguinal point to the adductor tubercle

## Branches:

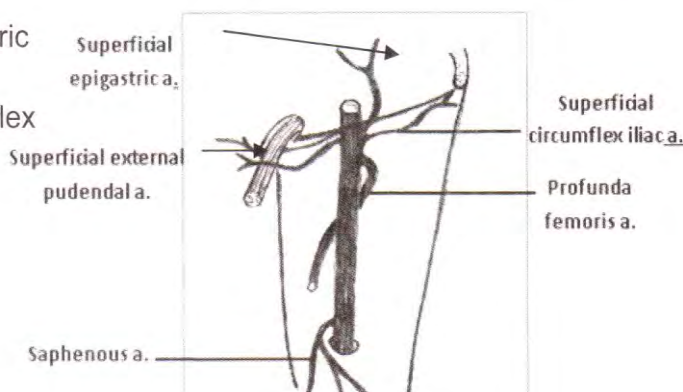
MCQ

It is the main artery of the LL & also supplies part of the ant abd wall

### A) 3 Superficial

MCQ

- Superficial external pudendal artery.
- Superficial epigastric artery.
- Superficial circumflex iliac artery.



### B) 3 Deep

MCQ

- Deep external pudendal artery.

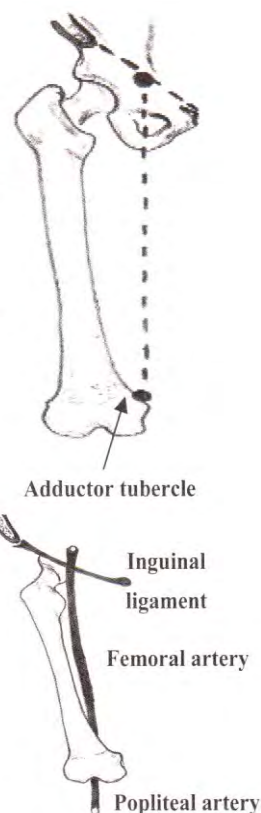
### Deep femoral artery (profunda femoris artery):

- It arises from the posterolateral aspect of the common femoral artery 2-4 cm distal to the inguinal ligament
- It is the main supply to medial & posterior compartments of the thigh.
- It gives 6 branches:
  - Lateral femoral circumflex artery
  - Medial femoral circumflex artery
  - 4 perforating branches

MCQ

### Descending genicular artery (anastomotica magna)

- Enters into collateral circulation around the knee

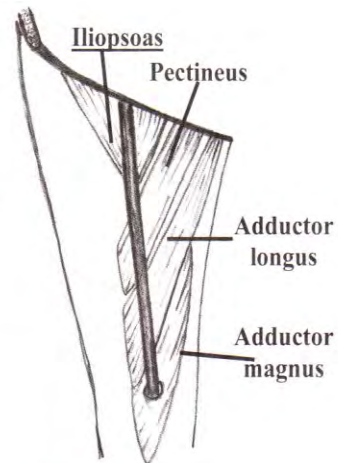


## Relations:

### ○ Common Femoral artery (above origin of profunda femoris a)

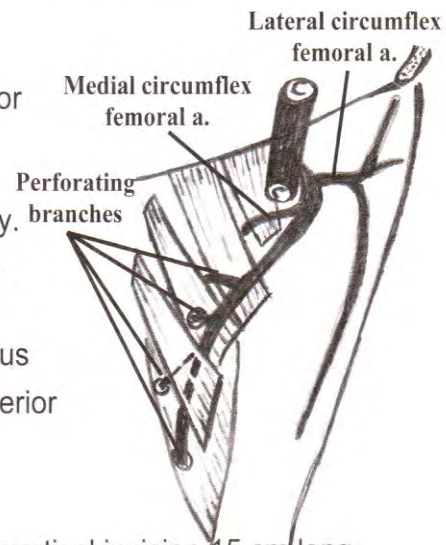
Lies in the lateral compartment of the femoral sheath. So

- **Medially** is the femoral vein
- **Laterally** is the femoral branch of the genitofemoral nerve & femoral nerve
- **Posteriorly** it lies on Psoas major & Pectineus muscle.



### ○ Superficial Femoral artery (below origin of profunda femoris a)

- Passes first in the femoral triangle.
  - Deep to it are the profunda vessels, pectineus & adductor longus muscles.
  - The femoral vein is first medial then behind the artery.
- Then the artery passes in the Hunter's canal
  - It lies posterior to the Sartorius
  - The femoral vein is first posterior then lateral to it.



## Exposure

- The femoral vessels are best exposed by a vertical incision 15 cm long and centred over the midfemoral point
- The deep fascia of the leg is incised, and the artery is found lying lateral to the common femoral vein
- The contents of the inguinal canal are protected by upward retraction



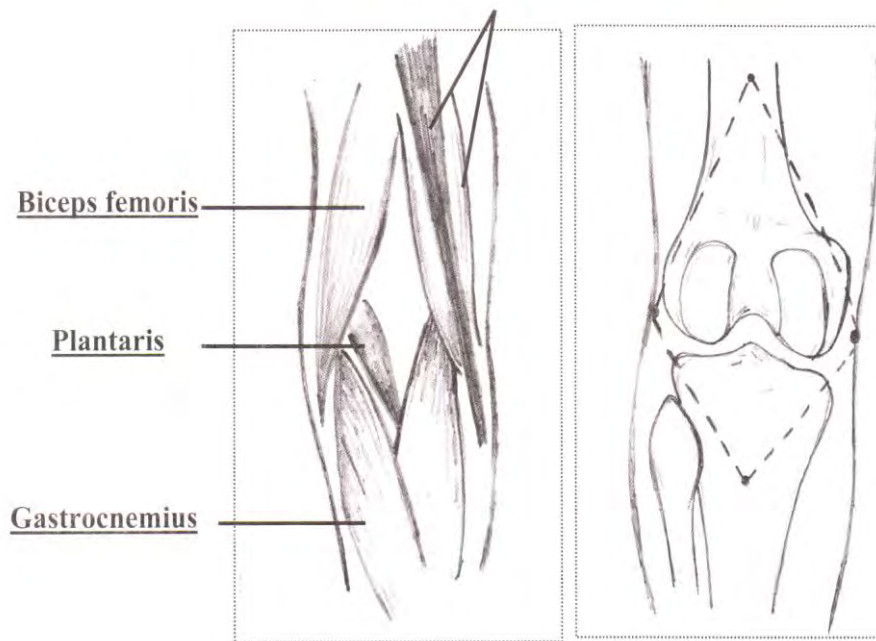
# Popliteal fossa

## BOUNDARIES:

MCQ

1. **Upper lateral:** biceps femoris.
2. **Upper medial:** semitendinosus & semimembranosus muscles supplemented by the sartorius, gracilis & adductor magnus.
3. **Lower lateral:** lateral head of gastrocnemius supplemented by the plantaris muscle.
4. **Lower medial:** medial head of gastrocnemius.

### Semitendinous & semimembranosus

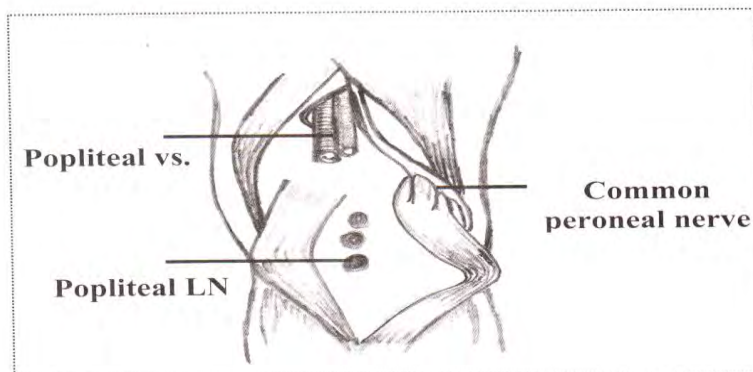


## CONTENTS:

MCQ

1. Lateral popliteal nerve (**common peroneal nerve**).
2. Medial popliteal nerve (**Tibial nerve**).
3. Popliteal artery.
4. Popliteal vein.
5. Termination of the **posterior cutaneous nerve of the thigh**.
6. Popliteal lymph nodes.

*All these structures are embedded in a variable amount of fat.*





## Roof:

*The roof of the fossa is formed by*

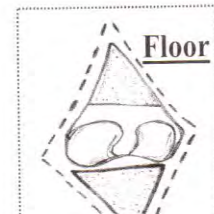
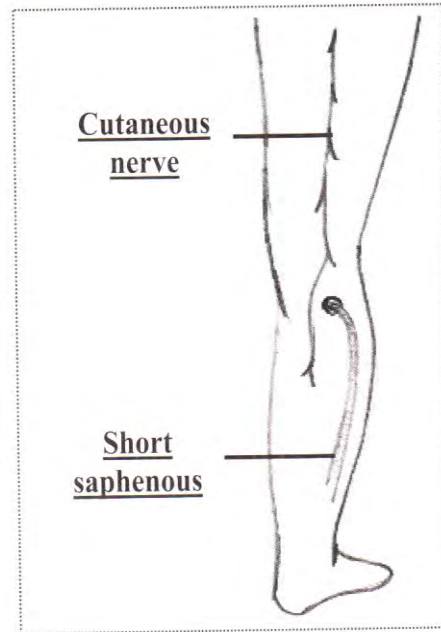
- Skin,
- Superficial fascia containing:
  - The upper part of the short saphenous vein
  - branches of the posterior cutaneous nerve of the thigh
- The deep fascia of the roof is called the popliteal fascia & is a downward extension of the fascia lata. *It is pierced by saphenous vein*

MCQ

## FLOOR:

MCQ

1. **Upper part:** popliteal surface of femur.
2. **Middle part:** back of the capsule of the knee joint.
3. **Lower part:** fascia covering the popliteus muscle. The lower limit of the fossa is the distal border of the popliteus muscle.

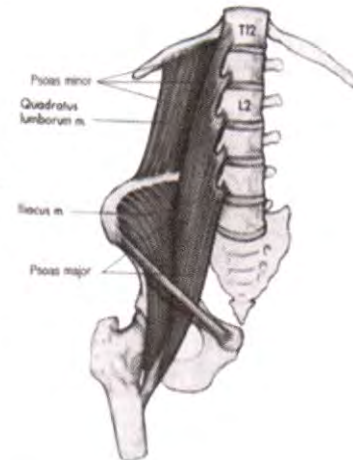


# Psoas Major

## ORIGIN:

MCO

- 1) Front of the transverse processes of all lumbar vertebrae.
- 2) By 5 digitations, each of which arises from the sides of the bodies of each 2 adjacent lumbar vertebrae and the intervertebral discs in between.
- 3) From tendinous arches attached to the sides of the lumbar vertebrae. These arches bridge over the lumbar arteries.



## INSERTION:

MCO

- The muscle descends medial to iliacus m & continues downwards to enter the front of the thigh **behind inguinal ligament above superior pubic ramus**.
- Its tendon receives fibers of the iliacus ms & is inserted into the **lesser trochanter of the femur**.

## NERVE SUPPLY:

Branches from the lumbar plexus (L 1, 2, 3).

## ACTION:

MCO

- 1) It flexes the thigh and rotates it medially. But in fracture of the neck of femur, the muscle rotates the thigh laterally.
- 2) Acting from below, the muscle bends the trunk forwards.

## PSOAS FASCIA

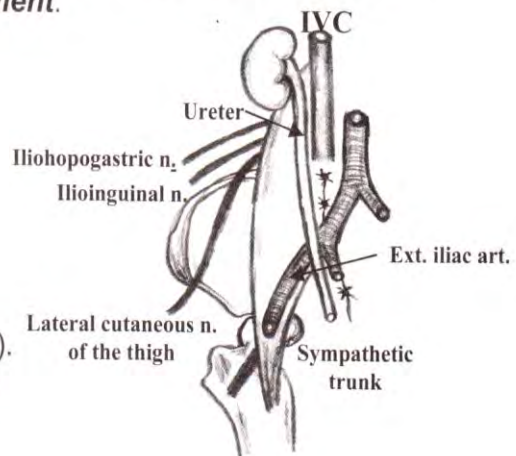
The Psoas Major is enveloped by the psoas fascia, which is thickened in its upper part to form the **medial arcuate ligament**.

## RELATIONS OF PSOAS MAJOR:

### • Anteriorly:

**Common for Lt. and Rt. muscles**

- 1) Kidney and its renal vessels.
- 2) Ureter and renal pelvis.
- 3) Gonadal vessels.
- 4) Genitofemoral nerve.
- 5) Psoas minor (in 60% of population).
- 6) End of the ileum (on the right) and descending colon (on the left).
- 7) Inguinal ligament.





**Specific for Lt. muscle**

4<sup>th</sup> part of duodenum, root of mesentery and superior mesenteric vessels.

**Specific for Rt. muscle**

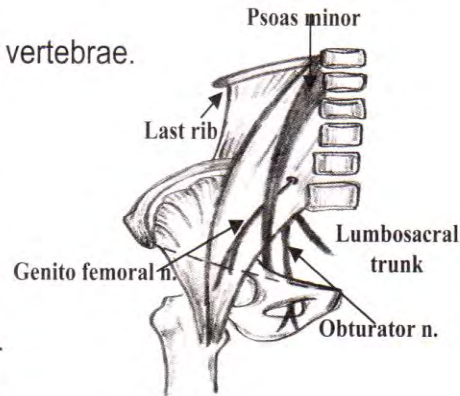
IVC, 2nd and 3rd parts of duodenum

• **Posteriorly:**

1. Transverse processes of lumbar vertebrae.
2. Superior pubic rami.

• **Laterally:**

1. Quadratus lumborum (above).
2. Iliacus (below).
3. Iliohypogastric nerve.
4. Ilioinguinal nerve.
5. Lateral cutaneous nerve of thigh.
6. Femoral nerve (the lower most).



**Medially:**

- 1) Sympathetic trunk (along its medial margin).
- 2) External iliac vessels (at the brim of the pelvis).
- 3) 2 nerves: obturator nerve and lumbosacral trunk.

## **POINTS OF SURGICAL IMPORTANCE:**

**a. Psoas sign:**

- In acute appendicitis, there is spasm of psoas major muscle → flexion deformity
- Hyperextension of the rib leads to abdominal pain (psoas sign)

**b. Psoas Abscess:**

- Produces cross fluctuation (DD: mass in the rt. iliac fossa & mass in the femoral triangle)

**c. Obliterated Psoas Shadow in X-Ray film:**

- Rupture spleen
- Perinephric abscess

**d. In fracture neck of the femur the muscle rotates the thigh laterally (not medially)**

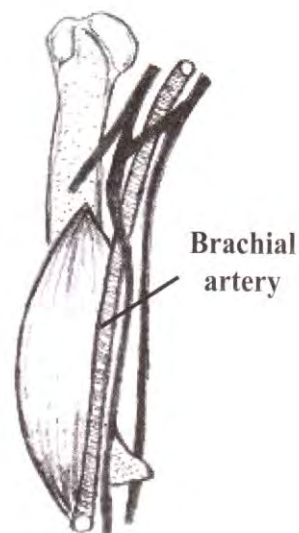
# Ulnar Nerve

## COURSE & RELATIONS:

### In the axilla & arm :

- It arises as the **termination of medial cord** of brachial plexus between 3<sup>rd</sup> part of axillary artery & axillary vein.
- It descends medial to brachial artery till the insertion of coracobrachialis where it deviates medially & downwards to pierce the medial intermuscular septum, to **reach the posterior compartment of the arm**

MCO



### In the forearm:

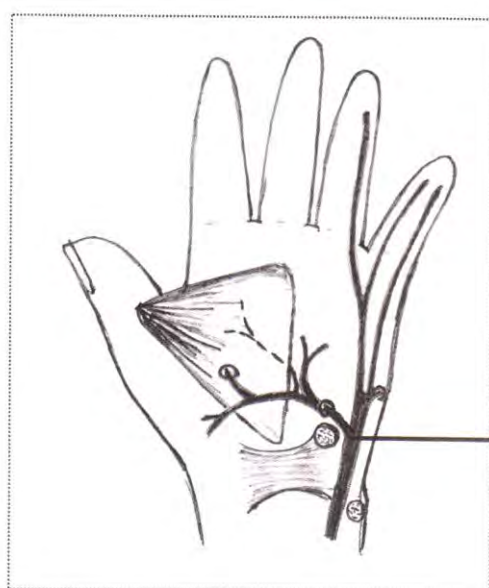
MCO

- It enters the forearm by passing **behind the medial epicondyle**
- It passes between the 2 heads of **flexor carpi ulnaris**, & descends along the medial side of forearm **between flexor carpi ulnaris & flexor digitorum profundus**
- Continues downwards **superficial** to the flexor retinaculum.



### In the hand :

- Terminates just lateral to pisiform bone by dividing into superficial & deep branches.



Termination of  
the ulnar n

## **BRANCHES:**



### **In the forearm:**

- **Motor:** to supply flexor carpi ulnaris + medial ½ of flexor digitorum profundus.
- **Sensory:**
  - medial ⅓ of the palm & medial ⅓ of the back of the hand
  - back of the medial 1½ fingers

### **In the hand:**

- **Motor:**
  - Adductor pollicis.
  - 3 muscles of the hypothenar eminence.
  - Palmaris brevis muscle.
  - 3rd & 4th lumbricals.
  - All interosseous muscles (palmar & dorsal).

*i.e., ulnar nerve supplies all intrinsic muscles of the hand except the 3 thenar muscles + 1<sup>st</sup> & 2<sup>nd</sup> lumbricals*
- **Sensory:** to the Palmar surface of the medial 1 ½ finger

## **SURGICAL IMPORTANCE (ULNAR NERVE INJURY):**

### **At wrist:**

- **Motor:**
  - Wasting of hypothenar eminence.
  - Partial claw hand.
  - +ve Froment's test.
  - +ve card test + loss of abduction.
  - Guttering between metacarpal bones.
- **Sensory:** sensory loss over:
  - Medial ⅓ of the palm.
  - Medial 1½ fingers.

**At elbow:** As above + loss of ulnar deviation + ulnar paradox



# Median Nerve

## COURSE & RELATIONS:

MCQ

### In the axilla & arm:

- It arises in the axilla by 2 braches from medial cord & lateral cord of brachial plexus (C5, C6, 7, 8 & T1).
- It crosses *in front* of the brachial artery *from lateral to medial*.
- It lies medial to biceps, anterior to brachialis & triceps

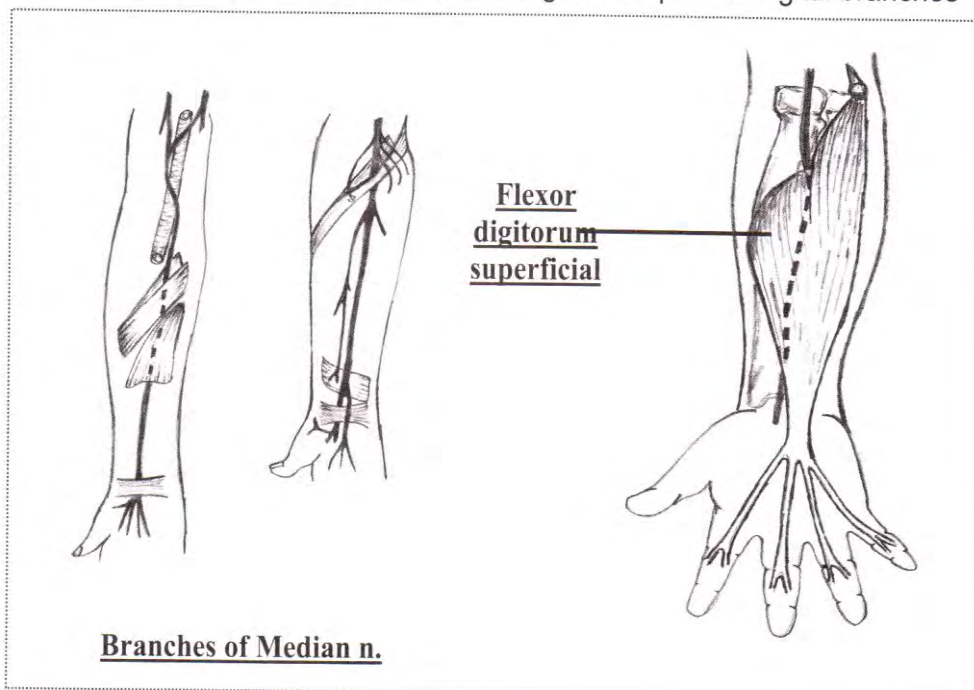
### In the forearm:

- In the cubital fossa, it passes:
  1. medial to the brachial artery.
  2. in front of the insertion of brachialis
- It leaves the cubital fossa by passing between the 2 heads of *pronator teres*.
- MCQ Passes *deep to flexor digitorum superficialis* where it is adherent to its undersurface & runs in front of flexor digitorum profundus.
- About 5 cm above the wrist: lies in the interval between flexor carpi radialis (laterally) & palmaris longus (medially).

### In the hand:

MCQ

- The nerve enters the carpal tunnel immediately **under cover of the flexor retinaculum**.
- **It terminates** Just distal to the flexor retinaculum, by dividing into lateral & medial divisions each of which gives off palmar digital branches



## BRANCHES:

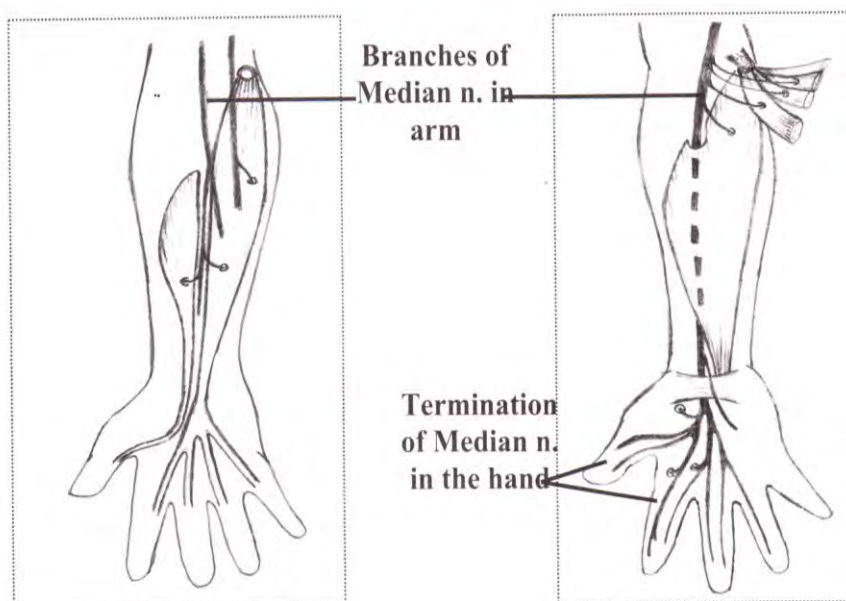


### In the forearm:

- **Motor:** to all flexors of the forearm except flexor carpi ulnaris + 1/2 flexor digitorum profundus
- **Sensory** (Palmar cutaneous branch): arises about 5 cm above the flexor retinaculum then passes in front of it to supply skin of the lateral 2/3 of the palm (but not the digits)

### In the hand:

- **Motor:** to the 3 thenar muscles (flexor pollicis brevis, abductor pollicis brevis & opponens pollicis) + lumbricals (1st & 2<sup>nd</sup>)
- **Sensory** (palmar digital branches): to the palmar surface of the lateral 3 1/2 fingers

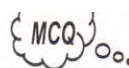


## SURGICAL IMPORTANCE (MEDIAN NERVE INJURY):

### At wrist:

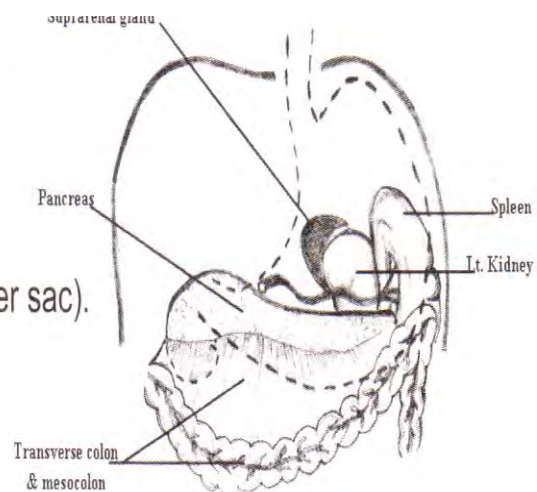
- **Motor:**
  - Waisting of thenar eminence
  - Loss of apposition
  - Weakness of abduction of the thumb
- **Sensory:** sensory loss over
  - Lateral 2/3 of palmar surface of the hand
  - Lateral 3 1/2 fingers (palmar surface)
- **Deformity:** Ape hand deformity

**At elbow:** As above + ulnar deviation + positive clasping test



## **B- Posterior: (The Stomach Bed)**

- 1- Lt. crus of the diaphragm.
- 2- Lt. suprarenal gland .
- 3- Lt. kidney.
- 4- Spleen (separated by greater sac).
- 5- Splenic a.
- 6- Body of pancreas.
- 7- Transverse mesocolon.
- 8- Transverse colon.



**N.B.** All are separated from the stomach by lesser sac except spleen by greater sac



# The Kidney

## Embryology:

fusion of mesonephric with metanephric ducts.



- Secreting part: from metanephros
- Collecting system: from ureteric bud of mesonephric duct

## Points of Surgical Importance:

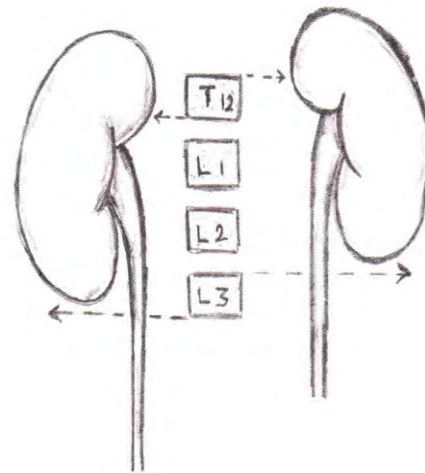
- failure of fusion of mesonephric with metanephric ducts → polycystic kidney
- in non rotated kidney, the hilum is directed anteriorly

## Anatomy:

**SIZE:** 12 X 6 X 3 cm

## POSITION:

- The kidney is retroperitoneal occupying the loins
- They are in the paravertebral gutter.
- The Rt. kidney is lower than the Lt. by 0.5 inch because of the pressure of the liver on the Rt. side.



|               | <u>Rt. Kidney</u>               | <u>Lt. kidney</u>               |
|---------------|---------------------------------|---------------------------------|
| 1. Upper pole | Lower border of T <sub>12</sub> | Upper border of T <sub>12</sub> |
| 2. Lower pole | lower border of L <sub>3</sub>  | Upper border of L <sub>3</sub>  |

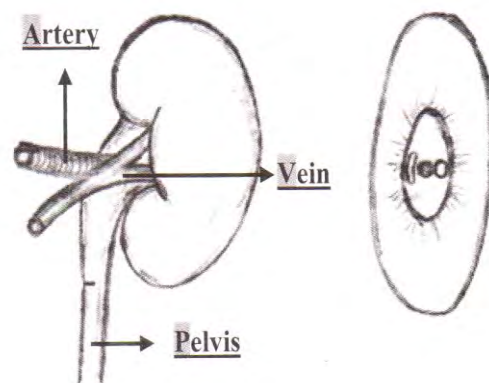
## PEDICLE:

In the hilum we have (VAP)

- Renal vein → anterior
- Renal artery → middle
- Pelvis of the ureter → posterior

## Surgical Importance:

In nephrolithotomy we open the posterior surface but at radical nephrectomy we open the anterior surface



## RELATIONS



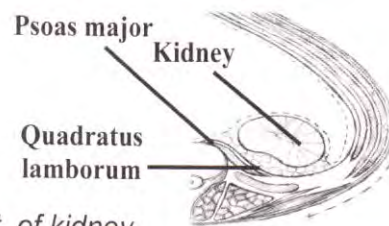
### A) Anterior Relations

- Left Kidney (stomach bed)
  - Suprarenal: above & medial
  - Spleen: above & lat.
  - Stomach: between suprarenal, spleen & splenic a.
  - Pancreas & splenic vessels
  - Splenic flexure: below & lateral
  - Small intestine: below & medial
- Right Kidney
  - Suprarenal: above & medial
  - Second part of duodenum: in front of hilum.
  - Rt. colic flexure: below & lateral
  - Small intestine: below & medial
  - Rt. lobe of liver: above & lateral



### B) Posterior Relations

- Both Rt. & Lt. Kidney.
  - 4 Muscles
    - 1) Diaphragm: superior
    - 2) Psoas major: lower medial
    - 3) Quadratus lumborum: lower intermediate
    - 4) Transversus abdominis: lower lateral.



#### 4 structures separating muscles from the post. of kidney

- 1) Subcostal vessels & nerve.
- 2) 11<sup>th</sup> & 12<sup>th</sup> ribs in Lt. kidney (only 12<sup>th</sup> rib in Rt.)
- 3) Iliohypogastric nerve
- 4) Ilioinguinal nerve

## BLOOD SUPPLY OF THE KIDNEY:



- 1) Arterial supply: renal a. (branch of abdominal Aorta at L1/L2)
  - Rt renal artery is longer than Lt renal a. & it passes behind IVC
  - Blood supply to the kidney is segmental → end arteries
  - Accessory renal arteries
    - are of common occurrence
    - usually arise from the abdominal aorta.
    - can cause ureteric obstruction
    - Ligation → infarction of the part supplied by them
- 2) Venous drainage: renal vein (drains into IVC)



## CAPSULE OF THE KIDNEY:

### A-Fascia Of Zukercandle (Gerota)(Perirenal capsule)

The fascia transversalis reaching the kidney splits into:

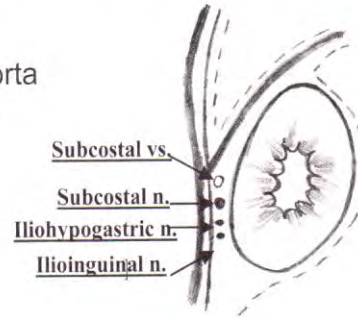
- Anterior layer → attached to aorta
- Posterior layers → attached to vertebral fascia

The two layers

- Above → fuse above
- Below → no fusion



N.B: Gerota fascia encloses the kidney BUT NOT the adrenal gland.



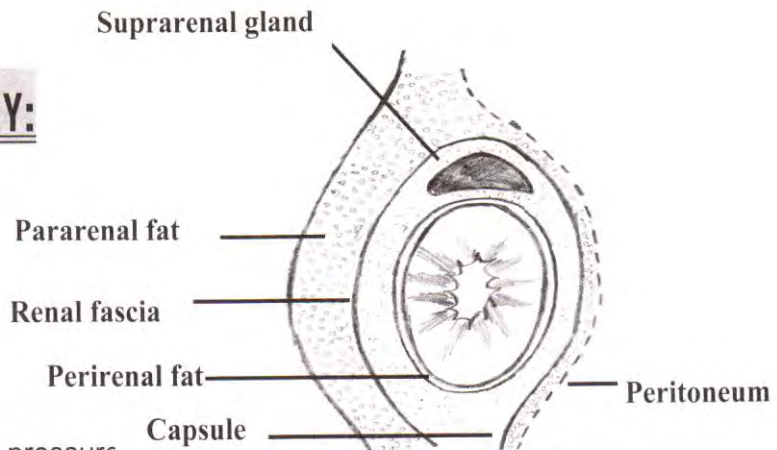
### B-Fibrous Capsule

### C-Perinephric fat

Surgical Importance no fusion from below → Kidney is liable to ptosis.

## STABILITY OF THE KIDNEY:

- Its position in the paravertebral gutter
- Its fascial & fatty capsules
- The renal vessels connecting the kidney to Aorta & IVC
- The intra-abdominal pressure

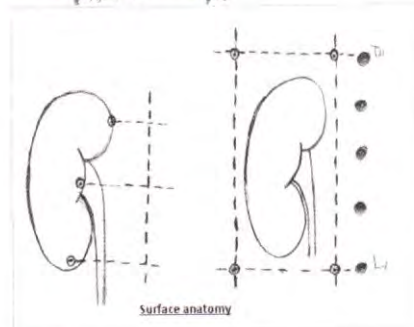


## SURFACE ANATOMY OF THE KIDNEY:

### A. Posterior surface markings of the kidney:

bounded by 4 lines (Morris' parallelogram):

- 2 vertical lines: 3, 9 cm from median plane
- 2 horizontal lines: at level of T<sub>11</sub> and L<sub>3</sub>



### B. Anterior surface marking of the kidney:

|           | Right kidney           | Left kidney              |
|-----------|------------------------|--------------------------|
| Upper end | 11 <sup>th</sup> space | 11 <sup>th</sup> rib     |
| Lower end | 5 cm above iliac crest | 6.5 cm above iliac crest |



# Urinary Bladder

## SITE:

- At birth: it lies in the abdominal cavity (Pelviabdominal organ)
- In adult: it occupies the anterior part of the pelvis (Pelvic organ)

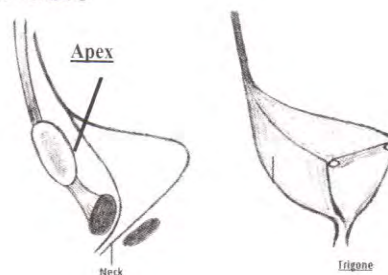
## 4 ANGLES:

- Apex:
  - attached to median umbilical ligament.
  - If remains patent, it may cause:
    - Urachal (sinus, fistula, cyst)
    - Congenital diverticulum
- Neck: Lying on prostate (♂) or pelvic fascia (♀), it gives the urethra  
 (MCQ) Surrounded by smooth muscle fibers constituting the sphincter vesicae
- 2 posterosuperior angles: receiving the 2 ureters

## 4 SURFACES: Superior, posterior & 2 inferolateral

## PERITONEAL COVERING: (MCQ)

- Male: superior surface & upper of base.
- Female: superior surface ONLY.

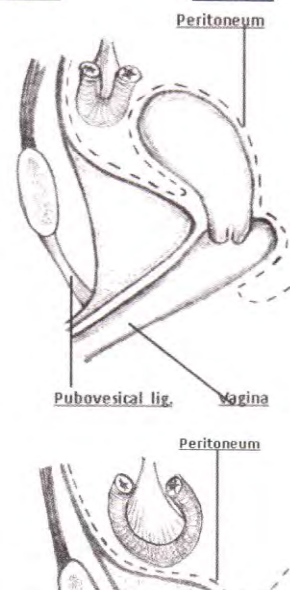


Angles

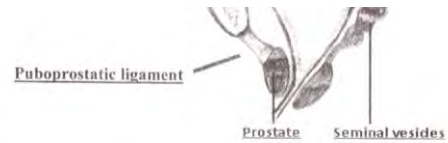
Surfaces

## RELATIONS

- Anterior:
  - Male: puboprostatic ligament.
  - Female: pubovesical ligament.
    1. They fix bladder in pelvis.
    2. They are present in Cave Of Retzius "Retropubic space"
- Lateral: Lateral wall of the pelvis.
- Superior:
  - Male: intestine
  - Female: the uterus & intestine



## CAVITY OF THE BLADDER



### Trigone:

- Triangular part of the base between the 2 openings of the ureter & the opening of the urethra
- Characters:
  1. No rugae
  2. Pink (rich blood supply)

**Surgical Importance:** (if stone → hematuria)

3. No submucosa

**Surgical Importance:** → No bilharziasis → No Egyptian cancer

4. It is richly supplied by nerves

**Surgical Importance:** It is more sensitive to pain.

### Ureteric orifices:

- They lie at the posterolateral angles of the trigone
- The 2 orifices are separated from each other by a transverse ridge called the interureteric crest

### Internal urethral orifice:

- It is placed at the lowest part of the bladder.
- It is surrounded by an involuntary non-striated muscle forming the sphincter vesicae.

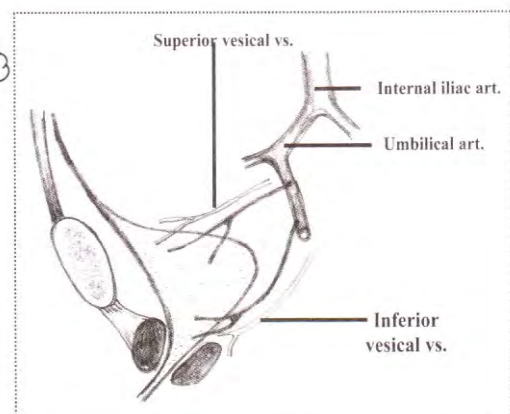
### Intramural part of the ureter:

- The lowermost part of the ureter passes obliquely through the wall of the bladder; this part is called the intramural part.

**Surgical Importance:** The oblique course of the intramural part is a factor in preventing regurgitation of urine into the ureter when the bladder is distended.

## BLOOD SUPPLY:

- 1) Vesical arteries: From internal iliac a.
  - 2) Vesical veins: → internal iliac vein.
- It is connected with vesal, ureteric, prostatic & hemorrhoidal plexus of veins.



## IDENTIFICATION DURING OPERATION

- Brownish network of muscles
- Bluish network of venous plexus
- Fill it with saline → Balloons.
- Stone



# Prostate

**NATURE:** it is a fibromuscular **exocrine glandular** organ.

MCQ

(Senile enlarged prostate is an fibromyoadenoma)

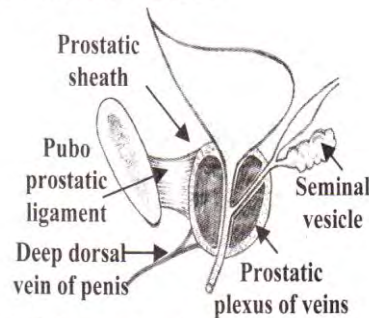
**SITE:** present in males, below the bladder neck & is behind symphysis pubis.

**STRUCTURE:** It is **partly glandular** consisting of numerous follicles, & **partly muscular** consisting of non-striated muscle fibres.

**SHAPE:**

MCQ

- It resembles an **inverted cone** with
  - its base directed upwards
  - its apex directed downwards.
  - 4 surfaces : posterior, anterior & 2 inferolateral.
- It weighs 8 gm & measures 4 cm from side to side at the base, & 3 cm from base to apex.

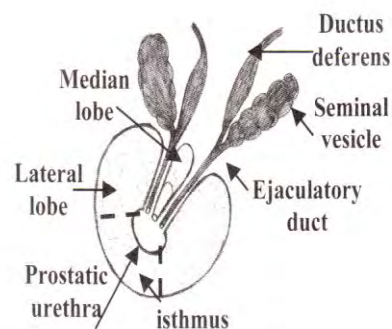


**CAPSULES:**

- It has a firm fibrous capsule which is adherent to the prostate substance
- **Inner** → true fibromuscular capsule.
- **Outer** → fascia capsule (***fascia of Denonvillier***), which delays direct spread of cancer between rectum & prostate.

**POSITION:**

- It **surrounds** the prostatic urethra.
- It **lies behind** the lower border of symphysis pubis, & in front of the lower part of rectum.
- Its level **lies** about 4 cm from the anal orifice → & thus can be palpated by PR examination.





## LOBES OF THE PROSTATE:

- By means of prostatic urethra to ejaculatory ducts , the prostate is divided into 5 lobes :
  1. Anterior lobe (isthmus) : in front of prostatic urethra , consists of fibromuscular tissue with little glandular tissue
  2. , 3. Right and Left Lateral lobes : one on each side of the prostatic urethra , they are the usual sites for senile enlarged prostate
  4. Posterior lobe : behind prostatic urethra but below the 2 ejaculatory ducts , It is the usual site for cancer prostate .
  5. Median lobe :
    - Between the upper part of the prostatic urethra and the 2 ejaculatory ducts
    - After Middle age , it produces " uvula vesicae " in the lower part of the bladder trigone .
    - It is also a common site for senile enlarged prostate.

### NB:



- The median lobe of the prostate contains more glandular material than the other lobes.
- During P/R: only Posterior parts of lateral lobes & Post lobe can be palpated

## RELATIONS:

- **Base:**
  - Surrounds the neck of the bladder
  - Pierced by the urethra.
- **Apex:**
  - Lies on the roof of the deep perineal pouch
  - The urethra emerges from the anterior surface of the prostate just above its apex.
- **Posterior surface:**
  - Lies in direct contact with the lower part of the rectum
  - It can be palpated by PR examination in the living.
- **Anterior surface:**
  - lies about 2 cm behind the pubic symphysis
  - It is connected to the pubic bones by the puboprostatic ligaments.
- **Inferolateral surfaces** (one on each side):
  - Rest on the anterior free borders of the 2 levator ani.
  - The most anterior fibres of the muscles sweep backwards on each side of the prostate to be inserted into the perineal body; these fibres form what is called the levator prostatae.



## STRUCTURES WITHIN THE PROSTATE:

- 1) **Prostatic urethra:** traverses the prostate from the base to the apex along the junction of the anterior  $\frac{1}{3}$  with the posterior  $\frac{2}{3}$  of the gland.
- 2) **Ejaculatory ducts:** the 2 ducts run downwards & forwards one on each side of the median plane to open into the back of the **prostatic urethra**.
- 3) **Prostatic utricle:** extends upwards & backwards from the prostatic urethra into the median lobe.



## PR EXAMINATION:

*The normal prostate is:*

# Smooth

# Soft

# Slippery rectal mucosa

# Sulci can be felt

# Symmetrical

## BLOOD SUPPLY:

A) **Arterial** → inferior vesical & middle rectal

B) **Venous**

- Prostatic venous plexus of Santorini which lies between the true & the false capsule.
- These are thin walled valveless veins
- It receives the deep dorsal vein of the penis
- It communicates with vesical venous plexus
- It drains into the internal iliac v. which communicates with int. vertebral venous plexus (valveless lateral sacral veins).

## SURGICAL IMPORTANCE:

Cancer prostate reaches vertebral column rapidly through valveless veins of BATESON

**Good luck**

**Dr. Wael Metwaly**